

# Blindness:

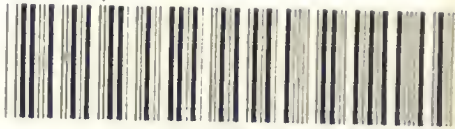
## ITS TREATMENT AND CURE.

BY G. C. HALL

ALLAHABAD:

1881.

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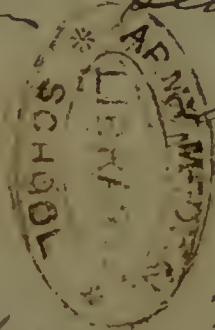
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Dear Sir,  
I am sending for  
attention to the Army  
Nile School library  
copy of my small  
book "Blindness in India"  
hoping it may prove  
useful to any intending  
Indian service man.

Yours faithfully  
D L  
H. W. Hall.  
Surgeon. I.M.S.



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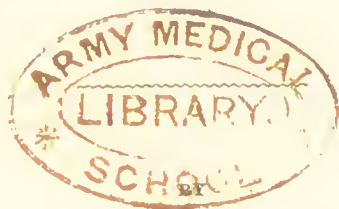
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CAUSES OF  
BLINDNESS IN INDIA.

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TREATMENT AND CURE, &c.



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SUPDT., CENTRAL PRISON, ALLAHABAD.

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Allahabad:

N.-W. P. AND OUDH GOVERNMENT PRESS, ALLAHABAD.

1881.

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H. H. H.  
C. H. H.  
H. H. H.



## P R E F A C E.

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IN placing this small work before my professional brethren, I am only influenced by a hope that the practical experience contained in it will be as useful to some of them as I know it would have been to me when I first came to India. I can look back on many an eye which has gone wrong through small details not having been sufficiently carefully attended to.

ALLAHABAD,  
*4th October, 1879.*

G. C. H.

## PREFACE TO SECOND EDITION.

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HAVING had very many mistakes, clerical and due to careless correction of proofs, pointed out to me in my former edition, I have been induced to revise and enlarge the work, which has received a very favourable reception and is acknowledged to contain very many useful hints and to be an aid to the operating Surgeon.

ALLAHABAD,  
*25th April, 1881.*

G. C. H.

## ON BLINDNESS.

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THE causes of blindness may be divided into those affecting the *eyes proper* and those affecting the appendages of the eyes, as lids and lashes. The first class of causes may, again, be subdivided into those affecting the refracting media and those affecting the sensory portion. The first division will thus include the *cornea*, lens, conjunctiva, iris, vitreous humor, and retina. The second division, the eyelids, eyelashes, and, more remotely, the lachrymal apparatus. The subdivision is obvious and contains the commonest causes of blindness in it. I will now enumerate these causes of loss of sight in order, commencing with the causes in the first division.

## FIRST DIVISION.

*Causes affecting Eyes proper.*

## CORNEA.

The various diseases to which the cornea is liable will be found in any ophthalmic work, and it is not necessary for me to enumerate them ; my only object being to point out those conditions which I have observed as being the cause of blindness, either total or partial. The first of these I shall notice is one which, although not in itself a disease, but the result rather of some former disease—I mean *leucoma*. These white dense patches of opacity so often seen in the eye of the native vary as much in their intensity as they do in the causation, and cause accordingly more or less indistinctness of vision, often amounting to total blindness. the loss of vision depending on both the position of the opaque patch as regards the pupil and the amount of opaqueness. They may be simply a small cloudy film, when they are called *nebulae* ; or the more dense white patch extending right through the tissue of the cornea, involving all

its layers, and not letting a trace of light through it, and effectually, when situated right in the axis of vision, causing complete blindness. The causes of this condition are those which cause destruction of the true tissue of the cornea in most instances, such as ulcers of all sorts, injuries of kinds, and very commonly small-pox. However, I have seen leucomata in which there was no ulceration, but simply a change in the appearance of the whole cornea or a portion of it. This is very often seen in the lower half of the structure, and appears to arise from a roughness and hardness of the edge of the lower lid constantly irritating the cornea, it just involving that portion of the cornea which is in contact with the edge of the lower lid. The epithelium of the cornea seem to get rubbed off by the constant friction. These leucomatous patches are invariably rough in appearance. Leucoma proper, by which I mean a condition in which the true tissue of the cornea has been destroyed and its place filled up by cicatricial tissue, is quite hopeless as far as medical treatment is concerned. The lesser opacities or nebulæ,

which are often quite as dense as leucomata, can, however, be very successfully treated, the success varying in proportion to the denseness. When the opacity is of a dense white and of old standing, medical treatment is of little avail. Still it ought always to have a trial. The treatment I always adopt, and found very successful, is to administer mercury internally, in the shape of blue pill one grain, opium half grain, twice a day, carefully watching the result, then using as a local application the perchloride of mercury lotion or the iodide of potass lotion, or ringing the changes on calomel powdered into the eye, or sulphate of soda used as a powder. The one I have found most successful is certainly the perchloride of mercury. I have seen changes take place in a dense leucomata under its use, the colour gradually becoming browner and the patient saying that more light seemed to come through. *Always give mercury internally in these opacities*: mercury has quite a specific effect on the eye. The strength of perchloride lotion I use is one grain to nine ounces of distilled water; the potass iodide lotion, five

grains to the ounce. After some two or three weeks of the above treatment there will be in most cases improved vision. I have found an instrument I had made and called the "opaeitometer" very useful in testing the result or treatment for these opaeitics. It consists of ten circular glasses, each more opaque than the other, ranging, therefore, from opacity 1 to opacity 10. Test the patient's sound eye with the "opacitometer" until the glass brought before the eye is of the same density as the *leucoma*—that is, he then sees the same with both eyes. Now number the opaeity, calling it by the number of the glass seen through, thus  $O=5$ ; treat him for a week, test again; if it is then IV., it shows that the opaeity is clearing up, and so on. Opaeities are also commonly the result of old ophthalmia, or of granular lids, or of trichiasis and its fellow distichiasis, but these usually present quite a different appearance from those caused by ulcer, not being so local, but rather more diffused over the whole cornea. The cornea also presents an appearance of facets on its surface, and in the lesser cases the patient states that on looking at a light

it appears blurred and he sees a large number of streaks of light, this being due to the rough state of the front of the cornea. The treatment must, of course, be appropriate for each case and cannot be commenced too soon, as it is on the correct treatment of the original disease that the advent or otherwise of the resulting cause of blindness depends: leucoma, it will be seen, being in all cases a result, and not a disease in itself.

Very often with leucoma in front of the pupil, or at the edge of the cornea, you will find another condition, anterior synechia, the pupil being attached to the seat of the old ulcer. Another condition also is anterior staphyloma, where the cornea has bulged forward. These two conditions require for their treatment various operations. In anterior synechia always first try strong solutions of atropine, as you may be able to tear down the adhesions; if they are slight but firm, pass in a needle and tear them down carefully. Iridectomies must be made in the iris opposite the clearest portion of the cornea. *Never be in a hurry with leucomata; they can*



always wait till you have tried effect of treatment before you operate. Deposits of lead are comparatively common from the use of lead lotions by natives : the lead lotion having been used when the original ulcer was present, it being a favourite remedy amongst *hakims* in India. Scrape off anything that looks like a separate portion of the cornea—I mean does not seem to be incorporated with it. The great consideration with a leucoma is how far it penetrates into the tissue of the cornea, and to ascertain this correctly always examine by reflected light every case of leucoma you see. Throw the light in sideways, so as to see behind the cornea by means of a plus lens held between the light and the eye examined—a concentrator in fact. It is astonishing how deceptive they are : some mere superficial opacities looking very dense, whereas they are proved by throwing a light behind them to be only just on the surface, and so almost certain to clear up under treatment. I consider that *leucomata* successfully treated, and blindness from the same cause remedied, a much greater triumph than a successful operation for

a cataract. There is not much to be said about the operation of iridectomy, which can be found described in every ophthalmic work. The only thing to be careful of is not to *injure the lens*, a mistake which is by no means uncommon ; it is usually done when trying to get hold of the iris with the forceps. For the benefit of less informed readers I will briefly describe the operation I usually perform. *No chloroform* is necessary. Open the lids with speculum, choose the clearest portion of the cornea, and at its extreme margin, actually in the sclerotic, insert an iridectomy knife : don't be afraid of making too big an opening, as being linear it always heals up—I mean, of course, in reason ; two lines long is about enough. Then take the iridectomy forceps and very carefully insert them (shut), endeavouring to see where the end of the instrument is going ; open the forceps gently, and try to catch hold of the iris ; draw it out of the wound and cut off as much as you can—that is a general rule ; but the more skilful you become, so the more you try and fashion your iridectomy. If the iris is attached to the back of

the cornea (*anterior synechia*) or to the front of the lens (*posterior synechia*) it is very often extremely difficult to get hold of it, or, if you do, you can only tear away a small piece. Under these circumstances it is a very good plan to cut through the transverse fibres of the iris and it will gape, admitting a sufficient amount of light for vision. The operation is over now. After-treatment consists of atropine and pad and bandage to keep the eye at rest.

*Keratitis*.—This is inflammation of the entire cornea and is very often remediable if seen in time ; if not, it intensifies the cornea as it were and constitutes a common cause of blindness, there being actually no certain remedy, as the entire cornea is involved. The syphilitic variety commonly observable in children is very easily cured if taken in hand in time. Apply atropine, keep the eye quiet with a pad and bandage, and administer grey powder. The cure is certain : the eye clears up almost miraculously. In old cases of dense cornea from inflammation I also have recourse to mercury with very good results, sometimes quite astonishing. I should give the

same rule for treatment of old *onyx* as for leucomata. *Try mercury.* Never despair until you have tried treatment for at least a month, if there is any perception of light pointing to sensitive retina.

In cases of opacity of the cornea from granular lids the cause of the condition must be treated. This disease will be noticed hereafter. I only mention it here, to call attention to the fact of its being a very common cause of opacity, and if allowed to continue the opacity becomes vascular and almost incurable. In some few cases of vascular cornea I have tried cutting out a piece of the conjunctiva in which the largest vessels were situated, so as to obliterate them with good effect. The operation is very simple : nip up the conjunctiva close to the edge of the cornea, including the vessel, and snip it across with a fine pair of scissors, taking away the piece ; the wound bleeds a little and after a few days the vessel has disappeared. The most important thing in all cases of opacity of the cornea which you may come across is to ascertain the cause : don't jump at conclusions until you have

thoroughly investigated the case ; don't send your patient away until you have satisfied yourself as to the duration of the opacity : its cause in the first instance ; how far it extends into the tissue proper of the cornea by examining with light ; has it ever been treated before ? and whether, in a case involving the entire cornea, some of it may only be remediable and allow of an iridectomy opposite to this part. I don't, I am sure, exaggerate when I say that there are thousands of blind people who could have some small amount of sight restored if they only had a little attention paid to them ; they can't be in a worse condition than they are. Try everything you can think of as a remedy ; don't despair until you have seen that all remedies are of no avail.

*Ulcers of the cornea* are again a common cause of blindness, this being commonly the result of old ulceration which has been neglected. Ulcers are of various kinds, varying from small, almost imperceptible, loss of epithelium to great loss of substance of the corneal tissue ; the stubbornest forms of ulcer being decidedly the

vaseular, in which vessels are seen coursing over the structure to the ulcer; and the semi-lunar, in which there is a deep half moon-shaped piece, looking as though it was punched out of the edge of the cornea, nearly always situated at the upper edge. I have just lately seen several cases of sloughing ulcer of the cornea occurring in children. They present the appearance of a yellow slough in the cornea with edges of the ulcer clean cut, the centre being occupied by the slough. They all occurred in half-nourished children from 3 to 6 years old and gave histories of from 8 days to a fortnight's duration—that is to say, eight days before in the case the child's eyes had been quite healthy, and when I saw her the eye was almost hopelessly gone. I treat them with milk diet, atropine, pad and bandage, and in two of the cases the improvement was very marked, the slough was very firmly adherent. The children had all been fed on *dál* and wheat or other grains. I particularly inquired into the diet and found that in none of them had the children been given anything else to eat. Natives do not seem to have the great belief in milk

that we do and cannot understand the rationale of a milk diet. I dare say the cost has a good deal to do with it. As I have four more cases at present under my care I cannot at present give any more results, but they look very hopeless. Ulcers cause blindness in two ways : either by healing and leaving a leucoma proper in the axis of vision, or by thinning the coat of the cornea so much that the aqueous breaks through and drags with it the iris, displacing and occluding the pupil. This, which is called anterior staphyloma, *with* anterior synechia, is described elsewhere with its treatment. The treatment, *par excellence*, for ulcers of the cornea is *atropine*, with a pad and bandage to keep the eye quiet, tonics and good food. We know how great an influence food of one sort exercises on the cornea, and hence a great indication in the treatment is to prescribe a nourishing diet ; this in the case of the native I always consider is best met by prescribing milk. No ulcer of the cornea refuses to mend under this treatment. In vascular ulcer I now adopt as well the plan mentioned before with regard to vascular cornea,

excising the larger vessels with a piece of the conjunctiva.

#### THE LENS.

*Cataracts.*—I don't intend in this small work to discuss nor describe the various operations for removal of cataract, but merely to give a few practical "hints." This being, I suppose, the commonest cause of blindness, is the one most commonly seen in dispensaries out here, the various others being more or less ignored. The time to operate depends entirely on the use to which the patient wishes to make of his eyes : I mean, if a man could not read or write and had no work to do, and could only just see his way about, which really was all he required to do, I would not operate till he had lost the power to a greater extent. *Never be in a hurry with cataracts.* If, on the other hand, a man could see his way about, but could not see to do his work, *operate.* Regarding the question of doing one or two eyes at a sitting, I decidedly, if both eyes are quite blind, do both ; if they are promising eyes, but if one is doubtful, I do it first, reserving the other in case of failure. If there is a



difference, choose the worse eye and do it only. Always test both eyes carefully by showing objects or pointing to common articles about the place, or using the opacitometer. If possible, keep your patient in hospital for a little time before the operation and feed him up. Don't operate on a patient in bad half-starved condition, simply because he will go away if you don't do it at once ; his eye will be almost sure to slough, no matter how careful you have been, and his ease will prevent no end of good ones coming to you. Always have the patient in a good light ; that is to say, never operate except you are quite satisfied that you will be able to see the pupil plainly after the extraction of the lens. Now a side light or back light in a verandah is not good : either do the operation in the open air, or turn the head inward, the feet outward ; then all available light will reach the eye, and the small piece of capsule, which would not have been seen before, becomes apparent, is extracted also, and the patient will have a good eye. Now as regards the operation, I have come to the conclusion that Von Graefe's modified

linear is the most satisfactory in its results and gives acuter vision. The description of the operation can be found in any work on ophthalmic surgery. I will only state a few little points to which I would call attention. The first is, try, in making the incision, to just barely tip the *cornea*;—that is, don't make your incision through the cornea, but rather all in the sclerotic, just at its junction. This is a most important point, and I have seen cases both out here and in England, where the incision has been too low, which have sloughed simply because the cornea was cut to too great an extent. The second point is to make the incision *very slowly*, not with a cut and dash. One of the most successful operators in London, Mr. Cowell of the Westminster Ophthalmic, lays great stress on this ; he passes the knife in very slowly and then commences cutting out gradually, being particularly careful of the conjunctiva. He seems to think there is great benefit from the gradual loss of aqueous instead of it rushing out. In cutting the iris be careful *not to pull too hard* with the forceps, or you will detach the iris, and the mischief which follows

will probably destroy the eye. The iris stands cutting well, but not tearing. In opening the capsule mind the point of the instrument is turned inwards, or you will scratch the cornea and have obscure vision as a result, opacity often following. The manipulation required for extracting the lens requires care, and it is only by practice that it is done skilfully. Seem to press, and yet not to press, downwards and inwards : seem to coax it out as it were. Now comes one of the great points which my friend the operator above referred to insists on (I never saw one bad case of his in six months): this is to thoroughly cleanse the chamber and lips of the incision by gentle pressure over the cornea, passing the scoop gently from below upwards *outside*. Be very careful in pressing on the cornea that it is in a moist condition, as it often gets dry in a very short time from exposure, and specially in the hot weather. To remedy this, bring up a little fluid blood, which is found at the lower lid, and wet it, or you will scrape the epithelium off and damage the eye. Little pieces of soft matter are squeezed out ; these are cleared away from the lips of the incision, all

clots of blood removed, and when the entire wound seems clean, the pupil quite clear, the eye may be shut, but not till then.' Anything left behind cannot as well be removed at a future time. I always take away all the blood which has clotted in the corners of the eye and all blood I can see. *All* these little points should be attended to quietly, no hurry is necessary ; it is not of any advantage to slip out a lens, then close the eye, as though a little light will hurt it: it won't. I have seen men operating. and one in particular, who always operated, closed up his eye as soon as the lens was out, and lost no end of cases. I never saw a good really acute vision following, because there was always something left behind. After-treatment required is very little : *paul and bandage* ; atropine not necessary, except there is any great pain or other sign of inflammation. Open in about three days to see how it is going on. I don't think it of such very great importance having the eye kept closely shut for very long as it is made out to be—I mean without opening it. I have come to the conclusion that three days is quite long

enough to keep the eye shut before opening it. After having examined it, close it again ; then see it daily, but do not open it if there be no signs of inflammatory action, such as pain or swelling of the lids. The reason I like to examine the eye once daily is to see that everything is as it ought to be and nothing further required to be done. Now if all right in about a month, test with glasses, showing dots to those who can't read. The glass required as a rule for distance lies between  $+9D$  and  $12D$  ;  $+10D$  is about the commonest ; then for near objects most probably  $+13D$  will be required. The dioptric measure is the one now used by all opticians. The way to bring the dioptric system to the old measurement is by dividing the number of dioptries ( $D$ ) into 36, which gives the old measurement approximately. Thus  $+9D = +4$  old measurements. A cataract operated on and the patient left without a glass is really of very little benefit : fancy yourself looking through a  $-10D$  lens, and you can have a vague idea of how much they can see ; I mean of very little good as far as doing any work is concerned.

The operation by extraction is well suited to all adults, but for children always by solution : first the lens will become absorbed, leaving perhaps a little piece of capsule more stubborn, which won't allow itself to be so easily disposed of. The operation, which consists of simply passing a solution needle through the edge of the cornea, the pupil having been first dilated, pass it straight into the lens, move the handle up and down ; *don't twist it round*, or you will drill a hole in the cornea, some needles having a cutting edge : this, if it does no other harm, will be sure to leave a white mark. The lens now swells up, and if it becomes painful, the needle should be passed in again and the soft disintegrated matter let out ; keep up the dilatation. In about three weeks, the lens in the meantime becoming bluer every day—I mean presenting a sort of bluish appearance from the absorption of the lens matter—and the vitreous being seen through, operate again. I don't think any fixed time or number of times the stirring up is required in any one case can be laid down. Cases vary so, but about once in three weeks is quite

often enough ; each time now soft matter is let out. This operation when successful, and it nearly always is, is a great triumph. You have all the conditions requisite for good vision : when the lens-functions are taken up by an eye-glass, a central pupil dilatable and clear cornea. I just mention the fact as an important one. In passing in the needle don't wound the iris, or you will find your case won't do quite so well. This being only intended as a sort of *aide*, I must not go into the less common operations, suction, &c., as they are very rarely advisable. Before I leave this portion of my subject, I will mention a few facts connected with the linear operations for cataract, and how to operate with left-hand as well as right. In the operations the difficulty always first experienced is in the making the incision in the proper place, and in crossing the anterior chamber with the knife without either wounding the iris or the cornea. What I wish now to point out is merely a very simple way of becoming proficient without spoiling the "hatful of eyes" some celebrated ophthalmic surgeon once said every surgeon must first do

before he became proficient. My plan is as follows :—Take a sheet of paper and fold it in curves, draw circles, the size of the cornea, in it, as many as you can get in ; then make a pupil ; take your knife, an old one of course, and cut all these imaginary eyes ; then, to become proficient with your left-hand, do the same. I can assure my readers that this gives you more confidence than spoiling eye after eye by either making the exit of the knife in the wrong place or piercing the iris and getting into a mess. Now as to the best thing to do if you find you have passed the knife behind the iris, the best thing is certainly to transfix and cut boldly out ; only take care afterwards when making your iridectomy not to leave any tags of iris hanging about. Another word of advice. If when you have taken hold of the iris with your forceps and are just about to cut off the piece with the scissors, the eye is suddenly turned up under the upper lid, *let go* ; don't hold on to the iris, or you will tear it away and most probably lose your eye : let it go and have the eye pulled down by an assistant. This is a most important point, as we can't be too careful



of the iris. Another point I have been much struck with since my last edition was published is the great danger in pressing out the lens, of bruising the iris between the cornea and lens. This is very liable to happen if the incision is not quite large enough and any extra pressure is required to get the lens out ; it is much better and leads to better results to at once enlarge the incision with scissor than to try to force the lens out. The great secret of cataract operations is the ease with which the lens find exit : *never use force to get it out.* These few accidents I mention as I have never seen them in any work, and have simply given you the result of my own experience, which I hope may be of some service to some. Another advice is, *never leave an eye with displaced lens :* I mean if by accident you should lose your lens by its being depressed behind the iris in your endeavours to coax it out, *don't leave it ;* get it out somehow ; get a large Macnamara scoop and fish for it. Don't imagine that your eye will have a chance if you leave it : it will if you take it out, and *take it out you must.* This is not by any means an uncommon accident,

and some few times I have seen it left behind, the operator thinking the best thing he could do was not to disturb the eye any more—a greater mistake he could not make as he soon discovers. I repeat my above advice : when *operating for cataract extraction, see that you extract your lens.* Macnamara's operation is a very good one and much easier to perform satisfactorily than Von Graefe's ; but I have not seen such acute vision in a comparative number of cases as in Von Graefe's. It will be found described in his admirable work on ophthalmic surgery, and the only thing I wish to say about it is the liability to displacement of the pupil and prolapse of the iris, which so often happens and interferes with the success of the operation. I think the main objection to the operation is the bruising the iris must undergo in inserting the scoop behind the lens and drawing it out again, as most of the failures are due to iritis. In drawing out the lens, very often the iris is dragged out with it and cannot be got back again ; many men leave it where it is and have a pupil of any accidental shape it may assume. I think a good plan to

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get it back is to apply Calabar bean to the eye and try and get contraction : thus drawing the iris back. I have seen good results follow this, but a really central pupil is not common : I don't mean in the skilful surgeon's hands who brought out the operation, but in the many cases I have seen and done. I never had the advantage of seeing Mr. Macnamara perform this operation, but I believe he performs it at home now with very great success. I will now pass on to the *conjunctiva*.

## CONJUNCTIVA.

The various forms of inflammation to which this tissue is liable are very often in one way or another the cause of blindness by causing the cornea to become involved and opaque ; it is from purulent ophthalmia that crowds of blind people are seen out here in India and in Egypt. This disease is so common, and yet how much it is neglected. I have had no end of cases which were quite hopeless, the entire cornea being dense ; and on enquiry into the history, got one of undoubted purulent ophthalmia not necessarily specific.

The native tells you how his eye got red, pained, swelled, matter flowed out, and he became blind. ‘Why did you not get some advice?’ ‘Oh, I thought it would get well of itself,’ or ‘I did put some antimony on my lids. My eyes are all right now, but I can’t see out of them; there is no pain.’ You then tell him he never will see again, and that he ought to have come to you sooner for treatment. It is sad to think how easily all this might have been avoided if the case had been treated sooner. Now as to treatment, all cases of purulent ophthalmia, I think, ought to be treated at once with strong solution of caustic—10, 15, 20 grains to the ounce, according to severity of the case. Foment the eye with belladonna lotion: one drachm ext. belladonna to an ounce of water, applied hot, and keep on the application right throughout the day if necessary. If this is done thoroughly no bad result will ensue, but the inflammation will subside almost miraculously. I have never seen it fail in any single case, and I have tried it very often and seen it tried. The same case treated in a mild sort of way

with some weak astringent will almost certainly cause the loss of the eye, either at once or by leaving after-effects, such as granular lids, which will require attending to afterwards. The principle to be borne in mind is, if this inflammation is not cut short in some way or other, the eye will not be able to come out of it whole and sound ; the longer it lasts, the more likely the eye to suffer. As we can get at the seat of inflammation so easily, our plan is plain : try all we know to close up some of these numerous, at one time invisible, vessels now only too apparent ; drive the blood away. Strong astringents do this, while the hot fomentations ease off the tissues by dilating the veins and relieving tension and soothing the part ; the belladonna acts as a general easer of pain and dilates the pupil, which relieves the cornea to a certain extent, a dilated pupil being always an indication to be attended to, specially in corneal cases. In very bad cases with great chemosis or swelling up of the conjunctiva, and evidently great tension, make free incisions backwards and forwards ; let out serum and blood freely ;

then drop in your caustic. *Don't be afraid of good heroic remedies.* Nothing can be worse for the eye than the disease it has ; so don't think you can hurt it, or can by any drops do it more harm. Be careful of all rags used, as the merest iota of a drop is sufficient to set up the same disease in the other eye or in your eye. *Wash your hands at once* and don't touch another patient until you have done so. Always commence treatment by giving a dose of sulph. magnesia or other saline purgative ; it is good safe treatment, and, as we often see as soon as it acts, the pain becomes less, just as very often a toothache is cured in the same way, the blood being drawn away to some other part. The most severe form in its frightful rapidity is the gonorrhœal. This I have known to completely destroy the eye in one day. I saw a man who told me that the day before his eye was quite sound, only itching a little ; he then presented in one eye an appearance of just one mass of granulations ; no cornea nor any other tissue visible. I incised deeply into the conjunctiva, used strong caustic lotion, and

next day, although there was a marked improvement, the cornea was broken through; a large anterior staphyloma followed. So it is not always possible to save an eye after it has been affected by gonorrhœal discharge, no matter how soon treatment begins. I have no doubt, however, that had I seen that man sooner, he would have had a better-looking eye eventually, although most probably very little sight. Blisters to the temples, setons, and local bleeding are often recommended. I don't doubt but that they are indicated, but I don't myself put much faith in them. The bleeding by leeches is perhaps the best; what I mean to say is they are all very well as adjuncts to the real active treatment, but they won't cure an eye with purulent ophthalmia until the eye is destroyed. The after-effects of purulent ophthalmia leads me on to the disease known as granular lid; as this, however, belongs to the other division, I must reserve it till I come to it. Also trichiasis and distichiasis; these belong to the same class and will be noticed further on. The various forms of inflammation of the conjunctiva do not require any special

remark, as not being often the cause of blindness, but rather causing only dimness of vision ; they will be found mentioned in the appendix. I now pass on to another disease of the conjunctiva, which is sometimes seen causing blindness : I refer to

PTERYGIUM.

This is, as most of my readers are no doubt aware, a growth on the conjunctiva, incorporated with it in fact, and seeming to be a lot of conjunctival tissues fastened together at one end, as though a portion of the tissue had been pinched up or stretched. The stretched appearance it always presents is very characteristic ; it presents a variety of shades of colour, from whitish faint pink to dark red. The shape is, as a rule, triangular, but not invariably as most books tell you. I have seen them in a variety of shapes, both ends the same breadth. It then being a sort of oblong, large conjunctival vessels can often be seen running along its long diameter ; it is sometimes hardly raised above the conjunctiva, sometimes stands out very considerably ; it, as a rule, has its thickest portion at the base ; sometimes it



is quite painless and stationary—that is to say, has not visibly increased for a number of years ; sometimes it increases very rapidly. I saw a case a very short time ago in which the entire cornea was covered with a large fleshy pterygium which, after having been stationary as a small one at the side of the cornea and not interfering with vision, had in four months increased to this extent, entirely destroying vision. My friend Dr. Deakin of Allababad saw this case with me. Sometimes you see it causing great irritation, the patient complaining that he can feel it every time he moves his lid. On turning up the lid it will be found distinctly granular, and the surface of the pterygium will be found red and angry-looking. Lawson states in his ‘ Diseases of the Eye ’ that he has never seen the pupil occluded completely. Wells, I believe, also says so. I have seen it quite closed up out here, where I believe the disease is more common and also severer than in England. This is when it causes blindness, and it is for this reason that it occupies our attention now. One more fact I may mention with regard to it is that very often it annoys

the patient by his apparently seeing it, or he says he does. I have often cross-questioned natives about this complaint, and they persist that they can see something in front of their eyes ; this is the case when it is encroaching on the pupil. It is certainly not uncommon to see a pterygium just reached to the margin of the pupil. Now as regards treatment, I certainly advise complete excisions ; other operations are mentioned and, I dare say, are good in their way : these are transplanting, tying with needles like you would treat a *nævus*, &c., but I have had such success with excision that I always do it now. Simply nip up the pterygium with a pair of double-toothed forceps and clip it off with sharp scissors, leaving the wound to heal up. Be very careful to cut the whole thing out, and the result will be a very small mark. As the wound contracts very much, a mark is always left on the cornea if it has encroached much ; very often, however, you will find quite clear smooth cornea underneath and scarcely any mark will be left. Now, with regard to a case in which there is complete blindness from pterygium, the treatment is to

*first excise the pterygium* ; then, when the wound is healed, if the pupil is still covered by the cicatricial leucoma which follows, make an iridectomy upwards and inwards, or as best may seem advisable. Another point I forgot to mention about pterygium is that it sometimes causes great obscurity of vision by altering the shape of the cornea and thus interfering with the proper refraction of light ; it causes a sort of astigmatism.\* This can only be treated *after excision*, as if done before, the glasses would not suit afterwards by means of proper glasses carefully tested ; for I remember seeing a sepoy who was sent to me as a bad shot, and his commanding officer thought he was shamming, as he could see objects far off : he all this time had a small pterygium which clearly interfered with his refraction, and although he could see objects, yet they were not where he thought they were : hence he could but shoot in the very least. This is a very important thing to remember and should always be looked for. There is one disease which is likely to be mistaken for ptery-

\*For explanation of term see *end*.

gium, being very like it : this is melanosis. I mention it—first, because the mistake might be a serious one if you told your patient that he had a very simple disease when he really had a very serious one, and one of which the proper treatment would be excision of the whole eye ; secondly, because I was present at an argument at an ophthalmic institution between four surgeons—Dr. Power was the diagnoser of the case—two being inclined to think the case pterygium and two melanosis ; it had all the appearance of pterygium, only small patches of pigment apparent in its substance ; it was very slightly raised, and caused apparently no inconvenience. I certainly thought it pterygium myself. but as the similarity was very striking, it is well to be on the look-out for the same sort of case and to be careful not to hastily diagnose all growths of this sort as pterygium. The case turned out to be a melanosis, I believe. These are all the diseases which the conjunctiva is subject to, causing blindness either from the disease itself or from its after-effects. I will now proceed to the next structure in the order I first gave them—namely, the

## IRIS.

This structure is very commonly seen out here in India to be a cause of blindness, and, happily, if it is the only one affected, admits of very successful treatment by various operations, good sight being restored where there was total blindness, and this in a very short time. The iris is peculiarly liable to inflammation, and it is a result of this inflammation that we are usually called upon to treat. It is unnecessary for me to enumerate all the various kinds of inflammation as given in ophthalmic works and does not come within the scope of this brochure. The various ways in which the iris causes blindness, all have the same cause—namely, the obstruction of the pupil preventing the light from reaching the retina; this may be the result of iritis, lymph having been thrown out and blocked up the pupil—a common result of the syphilitic variety, where there has been no treatment, as commonly happens in India, from natives in a village getting it, having no chance of being properly treated: this is a common result; or it may be that the iris has become prolapsed through an ulcer of the

cornea or small-pox, and the pupil pulled quite out of shape, becoming more or less blocked or shaped like a narrow slit. A carefully performed iridectomy in the case of the pupil being occluded seldom fails to restore very good vision ; make it upwards and inwards if you have choice, and, as repeated before, *don't touch the lens*. In the case of the attached iris to an ulcer always put in atropine first, then try and pass a needle and tear down the adhesions : this done, perform an iridectomy if the pupil does not appear to resume its place. The iris may again become a cause of blindness from an injury ; the obvious treatment will depend upon the result of the injury as to what is to be done, but what I wish to impress is the fact that in all cases where there is blindness and no pupil, never despair until you have operated. This may seem unnecessary advice, but I have seen lots of cases out here where men have sent the patients away as incurable who were perfectly cured by operation. Look at the dispensary returns and see the small amount of iridectomies returned compared to cataract operations. Another common form of

blindness from old iritis is where the pupil has become attached to the front of the lens (posterior synechia) and the capsule become opaque, showing a small white spot with the iris attached to it, all round presenting an appearance of small tags running towards the centre; the rest of the lens being very often quite clear, as discovered after operating. Preventions being better than cure, I will say a few words about the disease which leads to this blindness as I have seen it out here. The symptoms of iritis are great tolerance of light, pain, watering of the eye, irregular-shaped sluggish pupil, straight vessel under the conjunctiva running towards the cornea, pain in the forehead and temple of the affected side, a steamy appearance of the cornea and discoloured state of the iris, it getting a dusty dirty look. In bad cases a yellow opaque deposit may be seen at the lower margin of the cornea; this, which is called *hypopyon*, consists of pus which has formed and sunk to the lowest part of the anterior chamber. If very apparent it is best to make a small incision and let it out at once. Lymph seems in nearly all cases to be very

freely thrown out—I mean among natives ; their eyes seem to have a peculiar facility for inflammation, which is as a rule severe. Always give them mercury from the very beginning, carefully feeding them up ; at the same time apply atropine freely to keep the pupil as dilated as possible ; gradually bring them under the influence of the mercury by small doses combined with opium, and keep a pad and bandage over the eye to keep it quiet ; if this is begun in time no bad results will take place and the after-operation be quite unnecessary. We see more results of non-treatment of disease in its early stage in India than anywhere else ; so when we get the chance, should always try and impress on the patient the necessity of carefully doing all he is told, or he will lose his sight. Always in operating on the iris see that the corners of the incision are not occupied with a small piece of it ; seize it with forceps and cut it off, as these small pieces very often keep up irritation, and a sort of chronic inflammation ensues, keeping the eyes weak and intolerant to light. I now proceed to my next structure in order—namely, the



*Vitreous humor.*—There is no disease which really affects this structure which can be cured by operation proper as concerns itself, but I intend to notice the very important disease, glaucoma, under this heading. Hyalitis, an inflammation of the vitreous, seldom occurs idiopathically, but usually accompanies other diseases, as iritis or retinitis, specially the syphilitic variety ; it may also be induced by the presence of a foreign body, and is in this way often caused by the native *hakím* when he has couched a cataract or displaced it into the vitreous, it acting like a foreign body. I saw this very well shown in a case which had been couched a few days before and came to me for advice, there being no vision and great pain in the eye. I examined him with the ophthalmoscope, and found the vitreous quite opaque and cloudy ; could not see the fundus at all, but I saw the lens lying in the lower part behind the iris. I knew that leaving the patient alone, he would certainly lose the eye, so performed the linear operation for cataract : made a large iridectomy and extracted the lens with Mac-

namara's scoop. The eye did very well, but he never had good vision, although a very presentable-looking eye. The vitreous always afterwards remained cloudy, and black bodies could be seen floating in it. This was all the result of the displaced lens.

*Glaucoma.*—This is a disease which is very often seen, and in its early stage, when operation is of use not only in improving vision but also in arresting the progress of a disease which if not treated properly will certainly lead to blindness, and that quite incurable. The great importance, therefore, of diagnosis and operation is apparent; the appearance of a glaucomatous eye will be found in the appendix, and also the point of diagnosis between it and incipient cataract are points of importance. I'll repeat, *never turn away a patient who presents the least suspicion of haziness in lens without first examining him with the ophthalmoscope.* In a case of glaucoma in an early stage the likeness between it and cataract in its early stage is very great, and the mistake has, I am quite sure, been often made, the patient being

told to wait till the cataract is mature, and that then his vision will be restored ; whereas he goes on from bad to worse and eventually goes blind. *An iridectomy performed in the first instance would have saved his eye for years to come, perhaps for ever.* In a case of acute glaucoma always operate at once, making a good size irideetomy : if you don't, the eye will be lost ; if you do, saved in all probability. In old cases of ehronic glaucoma the only ehance to restore vision, where that is entirely lost, is to remove the lens as well ; but even this is seldom of any avail, and there is very often a gush of blood which effectually destroys the sight. I have seen this occur three times: now, the bleeding in one ease having oeeurred at the time of operation, and in the others during the night, the pad and bandage being found soaked the next morning ; some vessel seems to have given way from the too sudden removal of the pressure, which has, until the lens was taken away, been upon it. Always do your irideetomy upwards, as being both most convenient and being less seen, the upper lid covering it.

The time a patient has been totally blind from glaucoma has a great deal to say to the amount of benefit he is likely to receive from an operation. I have operated on a case in which there had been total blindness for six months, and the effect was that he could see big objects indistinctly afterwards. He eventually, however, became quite blind again ; this time I removed the lens, but with no good effect. Always give a patient a chance by operating : he cannot very well be worse than he is, and may regain some sight. I have a man now under my care whose one eye being disorganized I removed a year ago, and at the same time did an iridectomy on his other eye, which was almost blind : he had to be led to the hospital. Now he can see his own way about still, but says his sight is going again. His lens is hazy, and I am watching him. When his sight gets worse I will remove it, I have no doubt with benefit to him, as here I can watch the case, whereas as a rule such an opportunity does not occur. The vitreous plays a very important part in the operation for cataract, large quantities of it being lost some-

times during the operation. Some men say they like to lose a little vitreous, but I can't see the advantage of it, except in sometimes washing away small pieces of soft matter which may have been left behind. Mr. Macnamara told me that he always likes to break into the vitreous, and used to scatch it with a pricker, so as to get a good black appearance behind the pupil. Bad results very seldom follow loss of vitreous, except when in large quantity, though I think detachment of the retina might result from the sudden withdrawal of the natural support it must give this structure, also from the eye having a tendency to collapse. The field of vision is also liable to be contracted. I must refer the reader to the appendix for more on glaucoma, and will now proceed to the last structure in this division—namely, the

## RETINA.

This being the sensory portion of the eye and very delicate in structure prepares us at once for the fact that it is not by operations of any kind that we can hope to do good, except in one

class of cases—that is, when it is detached. We have in all other cases to trust to the effect of drugs, less certain no doubt in their action than the more bold operation with a knife, but still in a great many cases very effectual. For treatment of all retinal affections it is a *sine quâ non* that we first know what we are about to treat, and not simply give medicines on chance as it were. To do this effectually a skilful knowledge of the use of the ophthalmoscope is necessary. Description of how to use this instrument will be found in various ophthalmic works. The best advice I can give beginners is to practise daily, first of all on dilated pupils, then, as he becomes more efficient, on the undilated one. In natives of India retinae are very difficult to see at first, except the pupil is well dilated ; but after a little practice it becomes quite easy and the fundus distinctly seen. There is too much of an idea prevalent that it is almost impossible to make out much, except the pupil is dilated. This is a mistake, as my readers, if they practise for themselves, will find out. Retinitis from various causes is often seen out here ; if it has

been allowed to go on to total blindness very little can or will be done, as the changes which have taken place are too destructive or solid and organized to admit of being removed. The general symptoms of the disease I will briefly enumerate: they are dimness of vision—that is, dulness of surrounding objects; patient seems to think he is short-sighted and requires always a strong light; the field of vision is contracted and sometimes blank spaces seen, as though the sensibility of that portion of the retina on which the object fell was covered up; the dimness and darkness gradually increases till the entire field of vision is obscured and total blindness ensues. As will be seen when the ophthalmoscopic examination is explained, the obscurity of vision depends on how near the yellow spot the disease is, being greater the nearer to this extra sensitive portion. There is nothing peculiar about the external appearance of the eye to warrant anyone thinking there was serious disease of the eye. When examined by the ophthalmoscope, the retina presents a hazy, greyish appearance, looks velvety as it

were, as if covered by some semi-transparent effusion ; the disc looks woolly, which is the best expression I can think of to explain it ; it is, as a rule, somewhat like the rest of the retina in colour and seems less distinct than usual. There are seen patches of a darkish colour in various parts of the surface, and the vessels seem tortuous, more than normal, and lost in parts. These darkish-coloured exudations, which are extravasations of blood, also seem as if they were covered over with a veil or gauzy covering. The advantage or otherwise of treatment depends to a great extent on the amount of mischief which the nerve structure has undergone, as if the exudation is all in the connective tissue of the retina, and not involving the nerve structure itself, a good result will occur, specially if the case is non-syphilitic ; the reason being, I imagine, that the syphilitic variety is the most severe. The treatment most successful is a mercurial one. I always give as the least virulent form the ordinary blue-pill with opium, counter-irritate over the temple with biniodide, and give complete rest to the eye, testing it occasionally for any



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improvement or otherwise. The less the exudations, the better the chance of recovery. The case of a policeman (European) I had under me, however, had a great many scattered over the retina ; he is a great shikarri, and this was his shooting eye. I saw him from the beginning, and he got back very good vision, although not equal to what it was ; he has still the remains, and I have no doubt will find his sight getting worse as years go on. The various forms of retinitis and their treatment I will not dilate upon, as their proper province is in a regular ophthalmic work, and they can always be found there. Always insist on entire rest to the eye when there is retinitis ; keep the room dark, and don't let the patient go out without the eye being covered up.

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## SECOND DIVISION.

*Appendages.*

I NOW come to the second division of my subject. The first structure which claims our attention is a most important one, and one which is a very common cause of blindness, partial or complete—I mean the

## EYELIDS.

*Granular lids.*—I have no hesitation in saying that this is one of the commonest affections of the eye in India, varying in degrees of intensity from a simple roughness, which causes a feeling of weakness and slight soreness, and that is all, to the more prominent point, which rubbing against the cornea very soon turns it into a semi-opaque ground-glasslike structure. The dust and glare, I think, have a good deal to say of it; but this only, I imagine, refers to the slight case, the more severe ones being the remnants of an old ophthalmia. Now to describe this very common affection, a patient comes to you complaining of soreness and watering of the eye of some long

standing. You look at his eyes and say, 'Oh, yes, a little conjunctivitis; give him a little sulph. zinc lotion and let him go.' The chances are that you have sent away a case of granular lids, specially if the cornea looks at all rough. These are all the symptoms apparent in a slight case. Now turn up the upper lid and see what the state of affairs is: you will find little granulations apparent all over it, in patches; it has lost that extremely smooth surface, and as long as this is absent, so long will your patient's symptoms last. *Always examine the upper lid* of every patient who complains of pain in his eye, when you have the opportunity. The lid is very easily everted by taking hold of the eyelashes, drawing it outwards away from the eye, and simultancously pressing downwards with a director or handle of a small paint-brush, or other small object, on the outside of the lid. Cases will be seen varying from the slightest roughness of the lid as above to large fat sago-like-looking grains. It is these bad cases which more particularly concern us as causing complete blindness. The cornea becomes quite hazy,

and has, in many cases, large vessels running over it. The ease looks hopeless, but is not ; it is astonishing how soon the cornea clears after the cause of its complaint has been removed. In a very acute ease you will have very active symptoms : the patient will be unable to open the eye ; every effort he makes causes a gush of tears ; the cornea will be seen to be quite rough and abraded, and vessels seen coursing across it. This, which is called *granular ophthalmia*, supervenes upon a chronic case most commonly. The best treatment for it is fomentations of belladonna lotion until the acute symptoms subside ; then treat the granulations ; keep the lids quiet with pad and bandage. When the symptoms have subsided, some astringent applications must be applied to the lids. Various are recommended : they are argent nit., grains 20 to one ounce, pure liquor potassæ, cupri sulph., &c. The application, I like best is the chloride of zinc, grains 20 to 30 to the ounce. I have found it most successful. When you are applying it after having turned the lid up carefully, close down the everted lid, so that nothing can get into the eye ;

then paint on the caustic with a paint-brush. After a very few applications wash it all off with some clean water and another brush which you have by you for that purpose; wash freely, so as to prevent any of this strong caustic getting into the eye. A friend of mine once saw me treating a case of granular lids, and after I had applied the zinc chloride, he apparently did not notice that I washed the lids; he went straight away and applied the same solution to a patient's eye, omitting this important point of washing it off, with the result that the next day he said his patient would lose his eye he thought, and it was all my fault for recommending this strong lotion. After the application of any strong caustic to granular lids, a drop of castor-oil dropped into the eye has a very soothing effect and acts mechanically in stopping irritation. The appearance of the lids varies very much in different cases—in some presenting a number of red vascular growths like the head of a cauliflower; in others being of a palish yellow colour: these as a rule are old cases of long standing and very stubborn to cure. The vascular granulations

bleed very easily, often in everting the lid. Free incisions are often necessary in very swelled condition of the palpebral conjunctival surface ; scarify freely, then apply the caustic solution as above described. In some cases of old standing granular lids, in which the cornea has become quite opaque, has large vessels coursing over, and looks about as hopeless as a case as well could be, very satisfactory results have been obtained by inoculation with the fresh pus from a new case of purulent ophthalmia. This sets up this disease in the eye, and the result of the excessive inflammatory action is often to clear up the cornea and eradicate the vessels on it : patients who were totally blind recovering very fair sight. The only thing to be feared is sloughing of the cornea ; but if the vessels are very abundant, this does not often occur. I had a case of this sort under my care. This case did very well, but the patience of the patient was nearly exhausted before he recovered. He got back pretty fair sight. I would certainly try it again. The operation is a very simple one : just put some pus from a case of purulent ophthalmia

of a child into the inner corner of the eye ; put on a pad and bandage, and the inflammatory action will be set up ; treat it by fomentations. Do not attempt to cut it short by caustics, but simply conduct it through its various phases, and the result will be, if sloughing does not take place, partial or complete cure of the granular lids, which caused all the mischief, and clearing up of the hazy rough cornea. If there is much pain, preventing sleep, opiates may be given. Be very careful not to inoculate the sound eye, or most disastrous result will ensue. *Sound eyes are destroyed by the very disease which cures the diseased eye.* Another disease connected with the lids which produce results very like granular lids is what I come to next—namely, trichiasis and distichiasis ; but before I pass on to these, I would first call your attention to a condition of the cornea often seen connected with the lower lid : it is an opaque rough condition of the lower half of the cornea, occupying just that portion of the cornea which is touched by the edge of the lower lid ; the upper half of the cornea is perfectly clear, whereas the lower half

is quite rough and opaque, occasionally having small pieces of calcareous-looking materials stuck to it. The demarcation is most distinct and quite straight, not gradually shading off : it just as a rule cuts across the pupil. Now I have seen at least six cases of this sort and have never been able to come across a description of it or its cause, for, as I will now proceed to point out, I cannot make out sufficient cause for the enormous destruction and injury to the clear corneal tissue ; it has an appearance in some cases of being quite scooped out, the surface quite rough and lying in a lower plane than the sound part, yet there is no activity about it like in ulceration ; no active symptoms in the eye itself. Now as to the cause, it seems to me to be a thickening of the edge of the lower lid ; there is never any sign of trichiasis, only the hardness of the lid, which, however, seems quite smooth ; it may be the result of some old granulations which have caused the cornea to become hazy, and it has never recovered itself. I have never been able to cure these cases, but where the vision was affected, have made an iridectomy upwards



with great benefit to the sight. I tried treating one case on the principle of trichiasis of the lower lid by excising a portion of the loose skin of the lid ; but although there was slight improvement, the condition was not cured. I will now pass on to

*Trichiasis and distichiasis.*—This is a condition which causes by the constant irritation of the hairs turned in a roughness and opaque state of the cornea, similar to that produced by granular lids ; indeed, where only two or three small hairs are the acting instruments in the irritation, the eye looks exactly like one of granular lids : there is profuse watering, redness of the conjunctiva, and a more or less *unsmoothed* condition of cornea. I use the word *unsmoothed* advisedly, as this is really what it amounts to, there not being an actual roughness, but merely a look as though some of the epithelium had been scaled off. Mr. Power of the Westminster Ophthalmic showed me a very good case which, he said, had puzzled several university men at their examination. There was one small hair causing all the mischief,

and several men had diagnosed the case as one of simple conjunctivitis, not having looked beyond the conjunctiva for the cause. Cases will be seen varying much in both effects on the cornea according to length of time it has been going on, and in severity according to the amount of hair turned in and their length, the short sharp hairs being the worst. *Trichiasis in itself is a very common cause of blindness*, so that immediate remedies for relief should be tried in seeing a case, no matter how bad and incurable the eye may look. *All trichiasis cases* can be cured by very simple operations. Cases where there are two distinct rows of hairs are called distichiasis, and require to be treated the same as the fellow condition in which there is only one line turned in. *Pulling out hairs with forceps* is not only merely palliative but very painful to the patient, but the severer operations are both curative in their way—I mean the excising the entire hair bulbs or excising a portion of the upper lid. I prefer simply taking out a piece of skin and then sewing up the wound caused. The operation is

very simple and can always be repeated if necessary : lie the patient down and nip up a fold of skin of the lid *with* a pair of double-toothed forceps ; then with a pair of eurved scissors snip away as big a piece of skin as may appear necessary ; first see by pulling outwards with the foreeps that the amount will do what is required—namely, lift the hairs off the eornea. When the piece is cut out an oval bleeding space is left ; sew this together and apply a wet pad and bandage. If once does not suceced, repeat the operation in about a fortnight. I have found this a most suecessful operation and much less disfiguring than excising the bulbs. This only applies, however, to the single line of lashes ; in distichiasis the only plan is to exeise the bulbs. The operation for excision of the bulb is a very easy one and only requircs a little care : the eyelid being stretched with one hand, the operator, using a eataract knife, makes a long incision on one side of the lashes ; he then makes another on the other, and this meeting the first behind the bulbs, a wedge-shaped piece of the cartilage is taken out : this ought

to contain all the bulbs ; any small black dots seen in the wound being carefully removed, as these are hair bulbs and would grow again ; the wound is now left to granulate or join. The lid is left the same length almost, and it is only split really, and none of its free edge ought to be cut off. Setons ought not to be used, as they are apt to leave marks. The operation is much faeilitated by the use of a speculum, which snips the lid and keeps it tense, besides giving a surface to cut upon, at least to guide the incision as the edge is left free and compressing the lid stops are bleeding.

The lachrymal apparatus may cause dimness of vision from the duct getting occluded and causing tears to be constantly flowing over the cheeks, often abrading the skin. I merely mention this here as I have seen cases of great obstruction to vision only caused by this. the tears constantly welling up and blurring the sight. Slitting up the lower canaliculus and passing a probe afterwards is the cure. Remember the direction of the duct and do not force the probe in ; always try first with a director,

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as then the canaliculus can be slit up on it without the trouble of taking it out. The lower duct runs backwards and inwards, slightly inclined downwards. The nasal duct also causes epiphora, or overflow of tears, by becoming blocked. This is treated in the same way as above-mentioned. The only difficulty is in passing the probe. Pass it on along the canaliculus till you feel a hardish resistance, then turn the end of it up and pass down gently, the direction being backwards and downwards. You can always tell at once when you are in the duct, as the probe is tightly held and the patient experiences a sensation of it being in his nose. I have now completed my notes, and although I would wish to have made them more elaborate, I trust they will be of some use to the less experienced ophthalmic surgeon who is anxious to relieve suffering humanity without experimentalizing on his patients.

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## A P P E N D I X.

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### *Errors of Refraction.*

THE errors of refraction are three in number, namely—*Myopia*, or short sight, in which concave glasses are required; *hypermetropia*, very commonly called long sight, in which convex glasses are required; and *astigmatism*, in which glasses of peculiar forms are required. Also must be added to these *presbyopia*, or the sight of old and middle age.

*Myopia*, or short sight, is that in which the eye is longer in its antero-posterior axis than it ought to be; that is, the image is brought to a focus before the retina. This may be due to natural formation, or more commonly to posterior bulging or staphyloma. The short-sighted person is usually recognized by his closely approximating to his eyes a book given to him to read, squeezing the lids together when looking at a distance, or, if at hand, by the use of the test types, and also by external squint. The treatment is by suitable concave glasses; the *weakest glass with which he can see plainly being the right one for his use*, and in the case of a very myopic person, *half the number of the glass required for distance should be given for reading*

*and close work*; a good plan being for a very myopic person to have a pair of closing spectacles for reading, and to put the two glasses together for distance, thus avoiding the necessity of getting two pairs. It is often remarked, and is a popular idea, that a short sighted person's sight improves as he grows older. This is not true as far as his distant sight is concerned, but holds good with regard to his close point, and explained as follows:—After forty years of age the power of accommodation is impaired in the human eye, and the changes in the lens, which constitute presbyopia, begin to take place; that is, the lens becomes harder and the near point recedes to 9 inches—that is, taking a person about 40 years of age. Now, with each succeeding five years in life, it has been found that a person who originally had an emmetropic or perfect eye as regards its refraction requires for reading purposes a convex or + glass of about 1 dioptric, or to use the old nomenclature, one of 36 inches, or a + 36, to be added to the glass which suited him five years before, and after another five years have gone over, another addition of a + 36 or + 1 dioptric, and so on up to about 80. Thus a person with perfect eyes at 47 would require about a + 18 or 2 dioptics for reading. Now, had he been myopic—to say—18 for reading—it is naturally obvious that + and – cancel each other, so he finds that he now requires no glass at all, but he still would have to use his old glass for distance – 9 or 4 dioptics. The ophthal-



moseopic appearances of myopia are briefly the apparent ease with which the fundus is seen direct, and the vessels travelling in opposite direction to the head of the examiner when he moves it in either direction, and also posterior staphyloma.

*Hypermetropia.*—This is a very important error of refraction, as it gives rise to so many anomalous symptoms, and is, comparatively speaking, so very common. The symptoms commonly observed are, the person complains of pain over the eyes, watering, and general weakness after reading or writing for a short time; all the letters becoming mixed up together, and he has to stop and rest the eye for a while; these symptoms increase after a time, and there is general redness, and often some degree of photophobia, which is too often treated by application of astringent lotion, &c., as conjunctivitis, when it really only requires a proper + glass to remedy it. It is a general law that any person who can see test types as plainly through a convex or plus glass as he can with his naked eye is hypermetropic, and according to the strength of the glass, so is the degree of hypermetropia. I find it is a common anomaly of refraction among Baboos out here. Hypermetropic people, as a rule, do not require their glass for distance, but for near objects; however, a great degree of hypermetropia necessitates the constant wearing of glasses. In children internal squint is a common result of the anomaly just as external is in myopia; and a very common cause of squint operations being useless

is that this is not known, and the proper + glass not given to the patient after the operation. Now to diagnose the amount of hypermetropia in a person we require a set of test types and convex glasses, and the fact that they can read all the types without the glass must not allow us to be led into the common error that there is nothing the matter with their sight. Commencing from the weakest convex glass, we must continue to try them with successively stronger ones until we find the strongest with which they can read as well as they could with the naked eye. This gives us their manifest hypermetropia; we then, in the case of a person, say under 35, paralyze their accommodation with atropine, and after a couple of days' application of the drug try them again, and get what is called their latent or true hypermetropia: the strongest glasses we then find they see best with will be the ones they will require for after-use, so as to save them all straining of their accommodation which has been the cause of all their symptoms—their eyes being flatter from before backwards, they have been up to that time straining to render their lenses more convex. Supposing that after atropine has been put into the eye we find that a man—say of 25—requires a + 18 or 2 dioptrics; we do not give him that at once, but a slightly weaker one for a month or so, and then when he is used to it give him the stronger one, and then he gets used to relaxing his accommodation gradually. To find out the amount of hypermetropia in a

child of (say) seven years, who cannot read, requires examination in the erect image with an ophthalmoscope fitted with a number of convex glasses, and can only be attained after practice. Hence I will not describe it here, but once attained it is perfectly simple and a very satisfactory method of diagnosis. It consists in fixing a vessel of the disc and bringing glass after glass round before the opening of the ophthalmoscope until the vessel becomes blurred and out of focus; the last glass is the one the patient will require after the operation if he has squint, if not for ordinary use. Landolt's and Weeke's ophthalmoscopes are specially made for this purpose. The examiner, however, requires first to know his own sight, and also to get in the habit of relaxing his accommodation before any satisfactory result can be obtained. In the ophthalmoscopic examination of a hypermetropic person the disc is pinkish and the vessels go to the opposite direction to that seen in myopia, *i. e.*, in the same direction as the head of the observer.

*Astigmatism* is a complicated anomaly and consists of difference in the refraction horizontally and perpendicularly, or any particular direction of the plane of the eye. I only mention it to allow of its diagnosis. If we find a person has evidently some error of refraction, and neither  $+$  nor  $-$  glasses remedy it, we think of astigmatism. It may often be diagnosed at first, but this is speaking in a general way. It requires for its correction cylindrical glasses combined with either myopic

or hypermetropic ones. Fixing the amount of astigmatism sometimes occupies a very long time, as the range of glasses is so large, and each has to be put at the various angles with regard to its axis. The astigmatic test types are commonly used for this purpose; however, I don't consider a description would be at all plain, so will not trouble my reader with it. I will merely say that if they see a case doubtful, certainly not myopia or hypermetropia, think of astigmatism, especially if the patient have close-set small flat-looking peculiar eyes, and is not benefited by either + or — glasses.

*Presbyopia.*—This is a very simple anomaly to diagnose. Give a patient a newspaper, and you see him immediately put it off at some distance from the eye to read. Get the age, and if over 40, add on 1 dioptric or + 36 lens for each five years, and then try them with that glass, and it will most probably be found that it will suit them and relieve any symptoms they may have complained of, such as difficulty of reading and weakness of sight. Presbyopia combined with hypermetropia is a very common anomaly. and is treated by finding out the patient's hypermetropia first with the test types and then adding on their proper presbyopia glass for age, as described above. All that is required for the proper treatment of these very common and disregarded affections of the eye is a box of test glasses and a set of test types. All

glasses now in use in the various ophthalmic institutions at home are numbered on the dioptric system—1 dioptric being a glass of one metre, form 2 one of  $\frac{1}{2}$  metre, and so on. The advantage of this is that the vision is represented in decimals, which are always so convenient for scientific purposes. Thus  $+1.25D$  is what used to be called a  $+30$ . Always remember in presbyopia that an originally myopic person requires half his myopia deducted from what ought to be his presbyopia.

#### DIAGNOSIS OF COMMON DISEASES OF EYE.

*Cataract.*—This disease is generally very apparent, and, as it is commonly seen, can hardly be mistaken for anything but what it is, a white appearance with more or less yellowish discoloration being apparent behind the pupil. In some cases, however, of incipient and immature cataracts the case is different. Merely looking at the eye will not tell us much; we now require to use the ophthalmoscope. The appearances seen are that on throwing the light into the eye, we observe through and behind the pupil an appearance of stripes either radiating from the centre or taking a zonular form like a small black circle with the clear lens matter between; on illuminating the eye sideways these stripes are more apparent as greyish opacities. My readers may think this is all well-known information, but when I mention that once on a

medical invaliding committee a medical officer sent up some ten men as having "incipient cataract," none of whom had anything the matter with their lenses, I think I have shown that it is not generally known. The cause of the mistake in this case was the greyish appearance the native eye has when the pupil is dilated—due, I imagine, to the dark-brownish appearance of the fundus. This is one mistake to guard against; another is glaucoma. This may be diagnosed as will be hereafter described, but it is not so uncommon an error for a glaucomatous eye, with its steamy yellowish semi-opaque-looking cornea, to be mistaken for cataract. The ophthalmoscope clears up the case instantly, as at all events nothing wrong can be seen with the lens—I mean no dark lines or circles, although in some cases of glaucoma I have seen a general cloudy condition of this body. Dimness of vision is generally in proportion to the denseness of the cataract, but not always, as there may be some disease of the retina not apparent through the even immature cataract. I will not enter into the diagnosis of the various kinds of cataracts, as I find that, although known to exist, they are all treated alike out here, and a general sketch of the various diseases is all I intend.

*Glaucoma.*—I now proceed to the diagnosis of that obscure and ill-understood disease glaucoma. Firstly I will state that glaucoma may be simple or chronic, inflammatory or acute; these two divisions being the

ones mostly met with, and the simple being the variety most likely to be mistaken for cataract. The appearance of a patient suffering from simple chronic glaucoma are :—*Firstly*, partial or total loss of vision, the field being diminished more or less ; *secondly*, peculiar staring look, as if the eyes were being kept forcibly open: this is usually most striking ; *thirdly*, a steamy appearance of the cornea, as if it had lost some of its glossiness and had become dimmed ; *fourthly*, a dilated pupil ; *fifthly*, a peculiar yellowish, greenish, hazy state of the lens: this being so marked in some cases as to lead to the fatal mistake that the cause of the loss of vision complained of is entirely due to cataract ; *sixthly*, an increased hardness of the eye-ball. I may here give one standing piece of advice to my readers. If ever you see a case of yellowish opacity of the lens with dilated pupil, always suspect glaucoma in some form and look upon the case as doubtful. There, of course, may be both cataract and glaucoma present, but never operate in one of these doubtful cases without first examining the patient with the ophthalmoscope, so as to see the real condition of the lens. Pain is not a constant symptom in glaucoma. I have seen several cases both here at my hospital and in England where the patients had never complained of the slightest pain; all they had complained of was decreasing vision, the history of the case being thus far exactly like cataract, but all these cases were undoubtedly glaucoma simplex. I operated on three;

got good results as far as appearance was concerned, but no improvement in vision. The vitreous is often quite fluid, and after operating hæmorrhage frequently occurs. I purposely avoid dilating on the various forms of glaucoma, such as the secondary, &c., as I intend this paper merely as a general guide to non-ophthalmists. The acute form is not so likely to be mistaken for anything but what it really is, as the pain, suddenness of the attack, causation, age, &c., will point it out as not possibly being cataract. With regard to the treatment while any vision remains, perform a large iridectomy. I have even restored a partial amount of vision, amounting to appreciating a shadow, after all sight was lost; but I don't think anything can be done, as a rule, when total blindness has come on. I make a rule to always examine every patient with an ophthalmoscope who shows the slightest hazy appearance of the lens, and no mistake can occur in diagnosing between this disease and cataract. The ophthalmoscopic appearances are, briefly, a fulness of the vessels in the first stages, the veins and arteries in some cases seeming to run straight out towards the pupil; this being the first sign of commencing cupping of the disc, a symptom not always so apparent as is laid down in ophthalmoscopic works. The lens sometimes presents a general hazy appearance, very different, however, from the appearance described above in the paragraph on cataract. The pulsation, &c., of vessels. I need hardly say, are not apparent except to specialists.



Glaucoma is more commonly diagnosed first, and the ophthalmoscope brought to bear on the diagnosis. I will now pass on to a common affection in India, and one which causes great loss of vision, and is very frequently overlooked—I mean

*Granular Lids.*—A patient presents himself before you with dim, hazy cornea, eyes suffused, general redness of conjunctiva. Immediately suspect granular lids and evert the upper lids. The chances are that either you find the entire lid covered with small reddish points, like minute cauliflower-heads, or else he has turned-in lashes or trichiasis. The great point of diagnosis between trichiasis, or turned-in lashes, and granular lids, is that in the first, as a rule, the case is apparent at once, whereas in the latter nothing is apparent except the state of the cornea and conjunctiva. Both diseases act in the same way by their constant friction over the cornea; the granulation on the inner surface of the upper lid acting like so much sand-paper, the inverted lashes like so many small pricklers. Both require the same principle of treatment—*viz.*, removal. The granulations are best treated by the application of some strong astringent, such as unguent nit. in stick, if they are very numerous, or chloridine or zinc lotion, half dram to one ounce in water; always taking care to wash the surface of the lid before letting it resume its normal position with water and afterwards dropping a few drops of oil into the eye. The inverted lashes are treated by pulling them out, and,

if they return by operation, removing the entire ciliary bed roots and all, or by excising portion of upper lid as described previously. The hazy cornea, if not of too long standing and only extending to the outer layer of the cornea, soon regains its clearness when the lids are cured ; if not, various lotions, such as hydrag. perchlor. one-eighth of a grain to one ounce of water. or the lotion potass iodide, may be used. Don't forget the extremely necessary precaution of washing the everted lid well after applying a strong caustic, or your patient may rue it for the rest of his life, and keep the eye well moistened with any simple oil or glycerine.

*Iritis.*—The diagnosis of this disease is most important in its first stage. The patient complains of some derangement of vision, watering of the eyes, inability to stand light ; there is a general redness of the eye, the vessels running straight away from the edge of the cornea, pain more or less, sometimes completely absent, the pupil most probably contracted, perhaps irregular ; there may or may not be nodules of lymph on the edges of it, marking the cause as syphilitic. There is a want of clearness about colour of the iris—that is to say, it has a general dirty look. These symptoms can hardly be mistaken, and especially not if there is nothing else apparent to account for the watering and inability to stand light. The great principle of treatment is to dilate the pupil with atropine, keep it well dilated, and cover the eye up with a shade. The syphilitic of course

requires appropriate remedies, the special one being mercury.

*Ulcer of the Cornea and Phlyctænulæ.*—The first can hardly be mistaken and does not require any description beyond the advice I now give. If a child is brought to you screwing its eyes up and not allowing them to be opened except with great force being used, there being watering of the eyes also and general redness of the conjunctiva, always suspect ulcer of the cornea and treat accordingly as follows:—Drop in atropine at least three times a day and apply a pad and bandage, keeping the eye perfectly still and the pupil dilated well; give also tonics and cod-liver oil; except in very bad cases don't apply caustics.

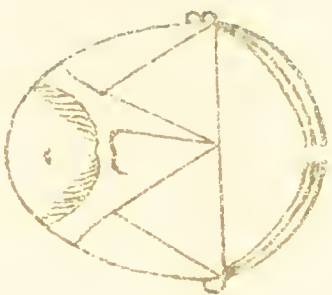
Phlyctænulæ are small raised-up-looking clear bodies with the appearance as if the conjunctiva were filled underneath with fluid, like a small vesicle; they appear in the edge of the cornea and are accompanied with some uneasiness. They are best treated with the unguent. hyd. oxyd. hyd. applied between the lids and rubbed over them with a circular motion. They sometimes go on to form ulcers, and should be treated as soon as seen; sometimes also they become pustular.

*Keratitis, or the Inflammation of the Cornea.*—There are various forms of this disease, but the one I wish to describe as being so amenable to treatment and important is the syphilitic. This is one of the common

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forms in which hereditary syphilis shows itself, and is very often seen in young people and children. The symptoms are haziness of the cornea, increasing with dimness of vision ; the colour of the cornea from the development of minute vessels becoming apparent gradually gets quite dirty or dusty ; there is pain and intolerance of light. The disease takes a long time to cure, but it does, as a rule, yield to treatment if taken in time. The best treatment is to apply atropine three or four times a day, bathe the eyes with warm water, or, better still, with warm belladonna lotion ; keep on a shade, and give appropriate anti-syphilitic remedies internally, mercury being, in my opinion, almost certain to cure. I have left out of this paper various common affections of the eye, such as conjunctivitis, &c., as I consider that nothing I could say would make them any more apparent to the reader. One exception, however, I will point out—that is, a rheumatic form, which is characterized by great pain in the eye-ball, general redness of the conjunctiva, with, however, a distinct white band just round the cornea : this is very apparent in some cases. The patients suffering from this disease are usually old rheumatic patients, and the appropriate treatment is some colchicum mixture and soda. This is essentially a sclerotitis, but its appearance is likely to be mistaken for conjunctivitis.

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Double Bandage applied  
under breast head.

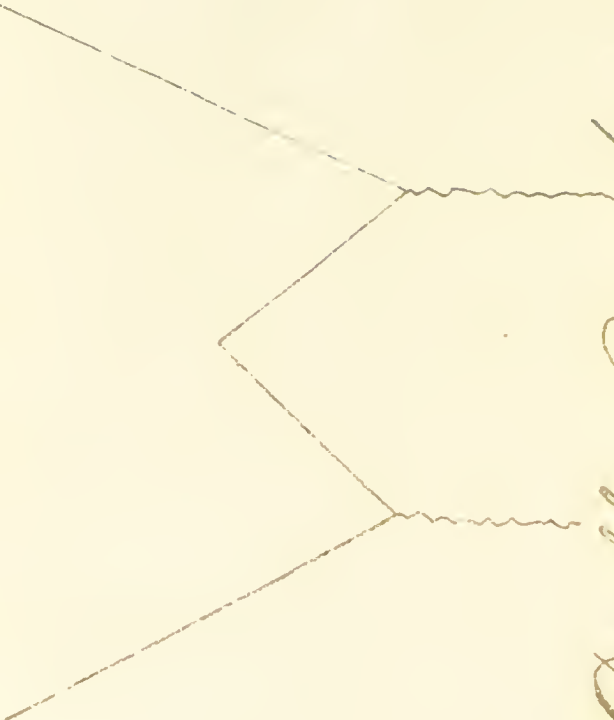




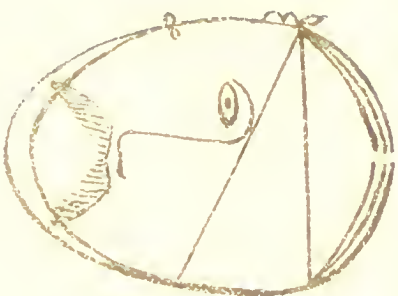








Double Barbed  
for fence wire.



Paradoxical









Barradage for one case







